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EXAMINER	
PIZIALI, ANDREW T	

ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/058,662	MUKAI, RYOICHI	
	Examiner	Art Unit	
	Andrew T. Piziali	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-6 and 19-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6 and 19-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *5/26/05 & 1/28/02* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/4/2009 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 4-6 and 19-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

Claim 1 states that adjacent crystal grains contact each other at a grain boundary to form a continuous seed crystal layer, but the specification does not mention crystal grains contacting each other at a grain boundary to form a continuous seed crystal layer. The Figures also fail to show this claimed limitation. Although Figures 2, 10 and 11 illustrate grain areas (29) as perfectly shaped rectangles due to perfectly straight grain boundaries (31), the figures and/or specification do not teach or suggest that the grains grow in perfect rectangular form around the nucleation site (27). The Figures merely illustrate the approximate area within which the grains partially occupy. It is also noted that page 12, line 30 to page 13 line 2 of the current specification fails to mention the crystal grains contacting one another.

4. Claims 1, 4-6 and 19-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

According to the teaching of USPN 5,846,648 to Chen et al., when a grain grows on a spatially spaced nucleation site, the grain does not contain the nucleation site, rather, the grain grows vertically on top of the nucleation site and the size and spacing of the nucleation site dictates the size and spacing of the corresponding grain (see column 8, lines 15 through column 9, line 53, and Figure 2). Thus, the current figures and the current specification convey to one skilled in the relevant art that each crystal grain grows vertically over a nucleation site rather than growing outwardly in every direction (into a perfect rectangular shape) and contacting each other at (perfectly straight) grain boundaries.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 4-6 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 6,602,621 to Matsunuma.

Regarding claims 1, 4-6 and 19-21, Chen discloses a polycrystalline structure film comprising metallic islands (74) formed on a surface of a substrate (12), a chromium seed crystal layer (24) containing crystal grains (76) and covering over the surface of the substrate (12) and the metallic islands (74), each of the crystal grains (76) having grown from a corresponding one of the metallic islands (74), and a magnetic crystal layer (16) containing magnetic crystal grains (78), each of the magnetic crystal grains (78) having grown from a corresponding one of the crystal grains (76) of the seed crystal layer (24) (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-65, column 10, lines 7-39, column 11, lines 11-22, the paragraph bridging columns 11 and 12, and column 16, lines 9-46). Chen illustrates adjacent crystal grains (76) being in contact with each other at a grain boundary to form a continuous seed crystal layer (Figure 2).

Chen does not appear to disclose that adjacent islands are physically spaced from each other, but Chen discloses that it is understood by one of ordinary skill in the art that grain spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite (column 2, lines 24-31, column 8, lines 15-48,

column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to physically space the islands (74), motivated by a desire to control the grain spacing because grain spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite.

Chen does not appear to specifically mention the metallic islands including atoms of at least one metallic element and molecules of a compound selected from an oxide or a nitride, but Matsunuma discloses that it is known in the magnetic recording art to use a material including atoms of at least one metallic element, such as Pt and Co, and molecules of a compound, such as SiN (see entire document including column 4, lines 18-65). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the metallic islands from any suitable material, such as Pt, Co, and Si_3N_4, because the resulting structure would possess reduced transition noise and/or high S/N and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability and desired characteristics.

Regarding claim 6, Matsunuma discloses that the compound may be present in a range of between 5at% and 20at% (column 4, lines 42-65).

Regarding claims 19 and 20, Chen discloses that each or the crystal grains (78) of the magnetic crystal layer (16) are separated from another crystal grain of the magnetic crystal layer at a grain boundary (see Figure 2). Chen also discloses that the crystal grains of the magnetic crystal layer are made of cobalt and platinum (column 15, lines 5-10). Chen does not appear to specifically mention chromium atoms diffusing along the grain boundary, but considering that

the crystal grains of the magnetic crystal layer comprise chromium (column 15, lines 5-10), and considering that the underlying intermediate layer is made of chromium atoms (column 11, lines 11-21), it appears that chromium atoms inherently diffuse along the grain boundary and form a wall of chromium atoms.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

7. Claims 1 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 6,620,533 to Hikosaka.

Regarding claims 1 and 19-21, Chen discloses a polycrystalline structure film comprising metallic islands (74) formed on a surface of a substrate (12), a chromium seed crystal layer (24) containing crystal grains (76) and covering over the surface of the substrate (12) and the metallic islands (74), each of the crystal grains (76) having grown from a corresponding one of the metallic islands (74), and a magnetic crystal layer (16) containing magnetic crystal grains (78), each of the magnetic crystal grains (78) having grown from a corresponding one of the crystal grains (76) of the seed crystal layer (24) (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-65, column 10, lines 7-39, column 11, lines 11-22, the

paragraph bridging columns 11 and 12, and column 16, lines 9-46). Chen illustrates adjacent crystal grains (76) being in contact with each other at a grain boundary to form a continuous seed crystal layer (Figure 2).

Chen does not appear to disclose that adjacent islands are physically spaced from each other, but Chen discloses that it is understood by one of ordinary skill in the art that grain spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to physically space the islands (74), motivated by a desire to control the grain spacing because grain spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite.

Chen does not appear to specifically mention the metallic islands including atoms of at least one metallic element and molecules of a compound selected from an oxide or a nitride, but Hikosaka discloses that it is known in the magnetic recording art to use a material including atoms of at least one metallic element, such as Pt and Co, and molecules of a compound, such as an oxide or nitride (see entire document including claim 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the metallic islands from any suitable material, such as Pt, Co, and an oxide or nitride, as taught by Hikosaka, because the resulting structure would possess improved recording resolution, improved resistance to thermal decay, and/or high S/N and because it has been held to be within the

general skill of a worker in the art to select a known material on the basis of its suitability and desired characteristics.

Regarding claims 19 and 20, Chen discloses that each or the crystal grains (78) of the magnetic crystal layer (16) are separated from another crystal grain of the magnetic crystal layer at a grain boundary (see Figure 2). Chen also discloses that the crystal grains of the magnetic crystal layer are made of cobalt and platinum (column 15, lines 5-10). Chen does not appear to specifically mention chromium atoms diffusing along the grain boundary, but considering that the crystal grains of the magnetic crystal layer comprise chromium (column 15, lines 5-10), and considering that the underlying intermediate layer is made of chromium atoms (column 11, lines 11-21), it appears that chromium atoms inherently diffuse along the grain boundary and form a wall of chromium atoms.

8. Claims 1, 4, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 5,631,094 to Ranjan.

Regarding claims 1, 4, 19 and 20, Chen discloses a polycrystalline structure film comprising metallic islands (74) formed on a surface of a substrate (12), a chromium seed crystal layer (24) containing crystal grains (76) and covering over the surface of the substrate (12) and the metallic islands (74), each of the crystal grains (76) having grown from a corresponding one of the metallic islands (74), and a magnetic crystal layer (16) containing magnetic crystal grains (78), each of the magnetic crystal grains (78) having grown from a corresponding one of the crystal grains (76) of the seed crystal layer (24) (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-65, column 10, lines 7-39, column 11, lines 11-22, the paragraph bridging columns 11 and 12, and column 16, lines 9-46). Chen illustrates adjacent

crystal grains (76) being in contact with each other at a grain boundary to form a continuous seed crystal layer (Figure 2).

Chen does not appear to disclose that adjacent islands are physically spaced from each other, but Chen discloses that it is understood by one of ordinary skill in the art that grain spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to physically space the islands (74), motivated by a desire to control the grain spacing because grain spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite.

Chen does not appear to specifically mention the metallic islands including atoms of at least one metallic element and molecules of a compound selected from an oxide or a nitride, but Ranjan discloses that it is known in the magnetic recording art to use a material including atoms of at least one metallic element, such as Ni, and molecules of a compound, such as Al_2O_3 (see entire document including column 6, lines 10-28). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the metallic islands from any suitable material, such as Ni_3P and Al_2O_3, as taught by Ranjan, because the resulting structure would possess improved corrosion resistance, higher coercivity, higher saturation magnetization, and/or higher squareness, and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability and desired characteristics.

Regarding claims 19 and 20, Chen discloses that each or the crystal grains (78) of the magnetic crystal layer (16) are separated from another crystal grain of the magnetic crystal layer at a grain boundary (see Figure 2). Chen also discloses that the crystal grains of the magnetic crystal layer are made of cobalt and platinum (column 15, lines 5-10). Chen does not appear to specifically mention chromium atoms diffusing along the grain boundary, but considering that the crystal grains of the magnetic crystal layer comprise chromium (column 15, lines 5-10), and considering that the underlying intermediate layer is made of chromium atoms (column 11, lines 11-21), it appears that chromium atoms inherently diffuse along the grain boundary and form a wall of chromium atoms.

Response to Arguments

9. Applicant's arguments filed 2/4/2009 have been fully considered but they are not persuasive.

Regarding the 35 USC 112 new matter rejection, the applicant asserts that the current specification describes adjacent crystal grains contacting one another at a grain boundary. The applicant cites page 8, lines 4-7, page 12, last line to page 13, line 2, and FIGs. 2 and 11. The examiner respectfully disagrees.

Page 8, lines 4-7 and page 12, last line to page 13, line 2 of the current specification simply disclose that the magnetic crystal layer 30 extends "over the surface of the seed crystal layer 28" and that magnetic crystal layer 30 possesses grain boundaries 31. The passage does not teach or suggest that the crystal grains of the seed crystal layer 28 are in contact with each other at a grain boundary to form a continuous seed crystal layer.

Figures 2 and 11 also fail to show this claimed limitation. Although Figures 2 and 11 illustrate grain areas (29) as perfectly shaped rectangles due to perfectly straight grain boundaries (31), the figures and/or specification do not teach or suggest that the grains grow in perfect rectangular form around the nucleation site (27). The Figures merely illustrate the approximate area within which the grains partially occupy.

Regarding the 35 USC 112 enablement rejection, the applicant asserts that the specification describes the claimed limitations on page 7, third paragraph and illustrates the claimed invention in Figure 2. Applicant's arguments are not persuasive because the applicant fails to cite any portion of the specification that enables one skilled in the art to make the invention. The examiner asserts that according to the teaching of USPN 5,846,648 to Chen et al., when a grain grows on a spatially spaced nucleation site, the grain does not contain the nucleation site, rather, the grain grows vertically on top of the nucleation site and the size and spacing of the nucleation site dictates the size and spacing of the corresponding grain (see column 8, lines 15 through column 9, line 53, and Figure 2). Thus, the current figures and the current specification convey to one skilled in the relevant art that each crystal grain grows vertically over a nucleation site rather than growing outwardly in every direction (into a perfect rectangular shape) and contacting each other at (perfectly straight) grain boundaries.

The applicant asserts that the seed crystal layer of Chen is not continuous. The examiner respectfully disagrees. A dictionary definition of "continuous" is "attached together in repeated units." The crystal grains (76) of Chen are attached together in repeated units (see Figure 2). At the very least, the crystal grains (76) of Chen are attached together by the metallic islands (22) located in the seed crystal layer (24) (see Figure 2).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew T Piziali/
Primary Examiner, Art Unit 1794